

1/18
SEQUENCE LISTING

<110> INSTITUT PASTEUR

<120> PKNB KINASE AND PSTP PHOSPHATASE AND METHODS OF IDENTIFYING
INHIBITORY SUBSTANCES

<130> D22486

<150> US 60/487,943

<151> 2003-07-18

<160> 20

<170> PatentIn version 3.2

<210> 1

<211> 514

<212> PRT

<213> Mycobacterium tuberculosis

<400> 1

Met Ala Arg Val Thr Leu Val Leu Arg Tyr Ala Ala Arg Ser Asp Arg
1 5 10 15

Gly Leu Val Arg Ala Asn Asn Glu Asp Ser Val Tyr Ala Gly Ala Arg
20 25 30

Leu Leu Ala Leu Ala Asp Gly Met Gly Gly His Ala Ala Gly Glu Val
35 40 45

Ala Ser Gln Leu Val Ile Ala Ala Leu Ala His Leu Asp Asp Asp Glu
50 55 60

Pro Gly Gly Asp Leu Leu Ala Lys Leu Asp Ala Ala Val Arg Ala Gly
65 70 75 80

Asn Ser Ala Ile Ala Ala Gln Val Glu Met Glu Pro Asp Leu Glu Gly
85 90 95

Met Gly Thr Thr Leu Thr Ala Ile Leu Phe Ala Gly Asn Arg Leu Gly
100 105 110

Leu Val His Ile Gly Asp Ser Arg Gly Tyr Leu Leu Arg Asp Gly Glu
115 120 125

Leu Thr Gln Ile Thr Lys Asp Asp Thr Phe Val Gln Thr Leu Val Asp
130 135 140

Glu Gly Arg Ile Thr Pro Glu Glu Ala His Ser His Pro Gln Arg Ser
145 150 155 160

Leu Ile Met Arg Ala Leu Thr Gly His Glu Val Glu Pro Thr Leu Thr
165 170 175

Met Arg Glu Ala Arg Ala Gly Asp Arg Tyr Leu Leu Cys Ser Asp Gly
180 185 190

Leu Ser Asp Pro Val Ser Asp Glu Thr Ile Leu Glu Ala Leu Gln Ile
195 200 205

Pro Glu Val Ala Glu Ser Ala His Arg Leu Ile Glu Leu Ala Leu Arg
210 215 220

Gly Gly Gly Pro Asp Asn Val Thr Val Val Val Ala Asp Val Val Asp
225 230 235 240

Tyr Asp Tyr Gly Gln Thr Gln Pro Ile Leu Ala Gly Ala Val Ser Gly
245 250 255

Asp Asp Asp Gln Leu Thr Leu Pro Asn Thr Ala Ala Gly Arg Ala Ser
260 265 270

Ala Ile Ser Gln Arg Lys Glu Ile Val Lys Arg Val Pro Pro Gln Ala
275 280 285

Asp Thr Phe Ser Arg Pro Arg Trp Ser Gly Arg Arg Leu Ala Phe Val
290 295 300

Val Ala Leu Val Thr Val Leu Met Thr Ala Gly Leu Leu Ile Gly Arg
305 310 315 320

Ala Ile Ile Arg Ser Asn Tyr Tyr Val Ala Asp Tyr Ala Gly Ser Val
325 330 335

Ser Ile Met Arg Gly Ile Gln Gly Ser Leu Leu Gly Met Ser Leu His
340 345 350

Gln Pro Tyr Leu Met Gly Cys Leu Ser Pro Arg Asn Glu Leu Ser Gln
355 360 365

Ile Ser Tyr Gly Gln Ser Gly Gly Pro Leu Asp Cys His Leu Met Lys
370 375 380

Leu Glu Asp Leu Arg Pro Pro Glu Arg Ala Gln Val Arg Ala Gly Leu
385 390 395 400

Pro Ala Gly Thr Leu Asp Asp Ala Ile Gly Gln Leu Arg Glu Leu Ala
405 410 415

Ala Asn Ser Leu Leu Pro Pro Cys Pro Ala Pro Arg Ala Thr Ser Pro
420 425 430

Pro Gly Arg Pro Ala Pro Pro Thr Thr Ser Glu Thr Thr Glu Pro Asn
435 440 445

Val Thr Ser Ser Pro Ala Ser Pro Ser Pro Thr Thr Ser Ala Pro Ala
450 455 460

Pro Thr Gly Thr Thr Pro Ala Ile Pro Thr Ser Ala Ser Pro Ala Ala
465 470 475 480

Pro Ala Ser Pro Pro Thr Pro Trp Pro Val Thr Ser Ser Pro Thr Met
485 490 495

Ala Ala Leu Pro Pro Pro Pro Gln Pro Gly Ile Asp Cys Arg Ala
500 505 510

Ala Ala

<210> 2
<211> 382
<212> PRT
<213> Homo sapiens

<400> 2

Met Gly Ala Phe Leu Asp Lys Pro Lys Met Glu Lys His Asn Ala Gln
1 5 10 15

Gly Gln Gly Asn Gly Leu Arg Tyr Gly Leu Ser Ser Met Gln Gly Trp
20 25 30

Arg Val Glu Met Glu Asp Ala His Thr Ala Val Ile Gly Leu Pro Ser
35 40 45

Gly Leu Glu Ser Trp Ser Phe Phe Ala Val Tyr Asp Gly His Ala Gly
50 55 60

Ser Gln Val Ala Lys Tyr Cys Cys Glu His Leu Leu Asp His Ile Thr
65 70 75 80

Asn Asn Gln Asp Phe Lys Gly Ser Ala Gly Ala Pro Ser Val Glu Asn
85 90 95

Val Lys Asn Gly Ile Arg Thr Gly Phe Leu Glu Ile Asp Glu His Met
100 105 110

Arg Val Met Ser Glu Lys Lys His Gly Ala Asp Arg Ser Gly Ser Thr
115 120 125

Ala Val Gly Val Leu Ile Ser Pro Gln His Thr Tyr Phe Ile Asn Cys
130 135 140

Gly Asp Ser Arg Gly Leu Leu Cys Arg Asn Arg Lys Val His Phe Phe
145 150 155 160

Thr Gln Asp His Lys Pro Ser Asn Pro Leu Glu Lys Glu Arg Ile Gln
165 170 175

Asn Ala Gly Gly Ser Val Met Ile Gln Arg Val Asn Gly Ser Leu Ala
180 185 190

Val Ser Arg Ala Leu Gly Asp Phe Asp Tyr Lys Cys Val His Gly Lys
195 200 205

Gly Pro Thr Glu Gln Leu Val Ser Pro Glu Pro Glu Val His Asp Ile
210 215 220

Glu Arg Ser Glu Glu Asp Asp Gln Phe Ile Ile Leu Ala Cys Asp Gly
225 230 235 240

Ile Trp Asp Val Met Gly Asn Glu Glu Leu Cys Asp Phe Val Arg Ser
245 250 255

Arg Leu Glu Val Thr Asp Asp Leu Glu Lys Val Cys Asn Glu Val Val
260 265 270

Asp Thr Cys Leu Tyr Lys Gly Ser Arg Asp Asn Met Ser Val Ile Leu
275 280 285

Ile Cys Phe Pro Asn Ala Pro Lys Val Ser Pro Glu Ala Val Lys Lys
290 295 300

Glu Ala Glu Leu Asp Lys Tyr Leu Glu Cys Arg Val Glu Glu Ile Ile
305 310 315 320

Lys Lys Gln Gly Glu Gly Val Pro Asp Leu Val His Val Met Arg Thr
325 330 335

Leu Ala Ser Glu Asn Ile Pro Ser Leu Pro Pro Gly Gly Glu Leu Ala
340 345 350

Ser Lys Arg Asn Val Ile Glu Ala Val Tyr Asn Arg Leu Asn Pro Tyr
355 360 365

Lys Asn Asp Asp Thr Asp Ser Thr Ser Thr Asp Asp Met Trp
370 375 380

<210> 3

<211> 271

<212> PRT

<213> Mycobacterium tuberculosis

<400> 3

Ile Thr Arg Asp Val Gln Val Pro Asp Val Arg Gly Gln Ser Ser Ala
1 5 10 15

Asp Ala Ile Ala Thr Leu Gln Asn Arg Gly Phe Lys Ile Arg Thr Leu
20 25 30

Gln Lys Pro Asp Ser Thr Ile Pro Pro Asp His Val Ile Gly Thr Asp
35 40 45

Pro Ala Ala Asn Thr Ser Val Ser Ala Gly Asp Glu Ile Thr Val Asn
50 55 60

Val Ser Thr Gly Pro Glu Gln Arg Glu Ile Pro Asp Val Ser Thr Leu
65 70 75 80

Thr Tyr Ala Glu Ala Val Lys Lys Leu Thr Ala Ala Gly Phe Gly Arg
85 90 95

Phe Lys Gln Ala Asn Ser Pro Ser Thr Pro Glu Leu Val Gly Lys Val
100 105 110

Ile Gly Thr Asn Pro Pro Ala Asn Gln Thr Ser Ala Ile Thr Asn Val
115 120 125

Val Ile Ile Ile Val Gly Ser Gly Pro Ala Thr Lys Asp Ile Pro Asp
130 135 140

Val Ala Gly Gln Thr Val Asp Val Ala Gln Lys Asn Leu Asn Val Tyr
145 150 155 160

Gly Phe Thr Lys Phe Ser Gln Ala Ser Val Asp Ser Pro Arg Pro Ala
165 170 175

Gly Glu Val Thr Gly Thr Asn Pro Pro Ala Gly Thr Thr Val Pro Val

5/18

180

185

190

Asp Ser Val Ile Glu Leu Gln Val Ser Lys Gly Asn Gln Phe Val Met
195 200 205

Pro Asp Leu Ser Gly Met Phe Trp Val Asp Ala Glu Pro Arg Leu Arg
210 215 220

Ala Leu Gly Trp Thr Gly Met Leu Asp Lys Gly Ala Asp Val Asp Ala
225 230 235 240

Gly Gly Ser Gln His Asn Arg Val Val Tyr Gln Asn Pro Pro Ala Gly
245 250 255

Thr Gly Val Asn Arg Asp Gly Ile Ile Thr Leu Arg Phe Gly Gln
260 265 270

<210> 4

<211> 271

<212> PRT

<213> Mycobacterium leprae

<400> 4

Asn Thr Arg Asp Val Gln Val Pro Asp Val Arg Gly Gln Val Ser Ala
1 5 10 15

Asp Ala Ile Ser Ala Leu Gln Asn Arg Gly Phe Lys Thr Arg Thr Leu
20 25 30

Gln Lys Pro Asp Ser Thr Ile Pro Pro Asp His Val Ile Ser Thr Glu
35 40 45

Pro Gly Ala Asn Ala Ser Val Gly Ala Gly Asp Glu Ile Thr Ile Asn
50 55 60

Val Ser Thr Gly Pro Glu Gln Arg Glu Val Pro Asp Val Ser Ser Leu
65 70 75 80

Asn Tyr Thr Asp Ala Val Lys Lys Leu Thr Ser Ser Gly Phe Lys Ser
85 90 95

Phe Lys Gln Ala Asn Ser Pro Ser Thr Pro Glu Leu Leu Gly Lys Val
100 105 110

Ile Gly Thr Asn Pro Ser Ala Asn Gln Thr Ser Ala Ile Thr Asn Val
115 120 125

Ile Thr Ile Ile Val Gly Ser Gly Pro Glu Thr Lys Gln Ile Pro Asp
130 135 140

Val Thr Gly Gln Ile Val Glu Ile Ala Gln Lys Asn Leu Asn Val Tyr
145 150 155 160

Gly Phe Thr Lys Phe Ser Gln Ala Ser Val Asp Ser Pro Arg Pro Thr
165 170 175

Gly Glu Val Ile Gly Thr Asn Pro Pro Lys Asp Ala Thr Val Pro Val

6/18

180 185 190

Asp Ser Val Ile Glu Leu Gln Val Ser Lys Gly Asn Gln Phe Val Met
195 200 205

Pro Asp Leu Ser Gly Met Phe Trp Ala Asp Ala Glu Pro Arg Leu Arg
210 215 220

Ala Leu Gly Trp Thr Gly Val Leu Asp Lys Gly Pro Asp Val Asp Ala
225 230 235 240

Gly Gly Ser Gln His Asn Arg Val Ala Tyr Gln Asn Pro Pro Ala Gly
245 250 255

Ala Gly Val Asn Arg Asp Gly Ile Ile Thr Leu Lys Phe Gly Gln
260 265 270

<210> 5

<211> 274

<212> PRT

<213> Corynebacterium glutamicum

<400> 5

Ser Thr Ala Thr Ser Ala Ile Pro Asn Val Glu Gly Leu Pro Gln Gln
1 5 10 15

Glu Ala Leu Thr Glu Leu Gln Ala Ala Gly Phe Val Val Asn Ile Val
20 25 30

Glu Glu Ala Ser Ala Asp Val Ala Glu Gly Leu Val Ile Arg Ala Asn
35 40 45

Pro Ser Val Gly Ser Glu Ile Arg Gln Gly Ala Thr Val Thr Ile Thr
50 55 60

Val Ser Thr Gly Arg Glu Met Ile Asn Ile Pro Asp Val Ser Gly Met
65 70 75 80

Thr Leu Glu Asp Ala Ala Arg Ala Leu Glu Asp Val Gly Leu Ile Leu
85 90 95

Asn Gln Asn Val Arg Glu Glu Thr Ser Asp Asp Val Glu Ser Gly Leu
100 105 110

Val Ile Asp Gln Asn Pro Glu Ala Gly Gln Glu Val Val Val Gly Ser
115 120 125

Ser Val Ser Leu Thr Met Ser Ser Gly Thr Glu Ser Ile Arg Val Pro
130 135 140

Asn Leu Thr Gly Met Asn Trp Ser Gln Ala Glu Gln Asn Leu Ile Ser
145 150 155 160

Met Gly Phe Asn Pro Thr Ala Ser Tyr Leu Asp Ser Ser Glu Pro Glu
165 170 175

Gly Glu Val Leu Ser Val Ser Ser Gln Gly Thr Glu Leu Pro Lys Gly
180 185 190

7/18

Ser Ser Ile Thr Val Glu Val Ser Asn Gly Met Leu Ile Gln Ala Pro
195 200 205

Asp Leu Ala Arg Met Ser Thr Glu Gln Ala Ile Ser Ala Leu Arg Ala
210 215 220

Ala Gly Trp Thr Ala Pro Asp Gln Ser Leu Ile Val Gly Asp Pro Ile
225 230 235 240

His Thr Ala Ala Leu Val Asp Gln Asn Lys Ile Gly Phe Gln Ser Pro
245 250 255

Thr Pro Ala Thr Leu Phe Arg Lys Asp Ala Gln Val Gln Val Arg Leu
260 265 270

Phe Glu

<210> 6

<211> 268

<212> PRT

<213> Thermobifida fusca

<400> 6

Gly Arg Tyr Glu Thr Val Pro Asp Leu Val Gly Val Glu Ser Asp Glu
1 5 10 15

Ala Arg Arg Asp Leu Arg Met Leu Gly Phe Arg Val Gln Thr Ala Glu
20 25 30

Glu Pro Ala Tyr Ser Asp Glu Ala Pro Pro Gly Thr Val Ala Ala Thr
35 40 45

Asp Pro Glu Ala Gly Ser Arg Leu Leu Pro Asp Thr Leu Val Thr Leu
50 55 60

Ile Leu Ser Ala Gly Pro Gln Tyr Val Glu Met Pro Asp Val Glu Gly
65 70 75 80

Ala Ser Val Ala Glu Ala Arg Asp Ala Leu Lys Glu Val Gly Leu Thr
85 90 95

Asp Ile Val Glu Asp Glu Ile Thr Ser Phe Asp Asn Pro Pro Gly Thr
100 105 110

Val Ile Thr Thr Lys Pro Ala Pro Gly Glu Lys Ala Asn Arg Glu Glu
115 120 125

Ser Val Thr Leu Thr Ile Ser Ala Gly Phe Pro Met Pro Asn Val Val
130 135 140

Gly Gln Lys Val Asp Asp Ala Arg Arg Leu Leu Glu Ser Ser Asp Leu
145 150 155 160

Glu Val Thr Val Val Glu Glu His His Asp Glu Val Pro Glu Gly His
165 170 175

Val Ile Ser Gln Glu Pro Glu Ala Glu Thr Thr Val Gly Ala Gly Gln
180 185 190

Ser Val Thr Leu Thr Val Ser Ser Gly Pro Glu Leu Val Glu Val Pro
195 200 205

Asp Ile Arg Gly Trp Lys Val Asp Lys Ala Arg Lys Glu Leu Glu Glu
210 215 220

Arg Gly Phe Glu Val Thr Val His Gln Val Ile Gly Asn Arg Val Gly
225 230 235 240

Asp Tyr Asn Pro Lys Gly Glu Ala Pro Lys Gly Ser Thr Ile Glu Ile
245 250 255

Trp Thr Ser Pro Phe Gly Arg Glu Arg Asp Arg Asp
260 265

<210> 7

<211> 274

<212> PRT

<213> Corynebacterium efficiens

<400> 7

Ser Ala Ser Thr Gln Gln Ile Pro Asn Ile Val Gly Leu Pro Glu Asn
1 5 10 15

Glu Ala Val Leu Glu Leu Glu Arg Leu Gly Phe Thr Val Val Leu Thr
20 25 30

Thr Glu Pro Ser Pro Asp Val Ala Glu Gly Leu Val Ile Arg Thr Ser
35 40 45

Pro Asn Val Gly Ser Glu Ile Arg Glu Gly Ala Thr Val Thr Leu Thr
50 55 60

Ile Ser Ser Gly Arg Glu Val Val Thr Ile Pro Asp Val Thr Gly Leu
65 70 75 80

Thr Leu Ala Glu Ala Thr Arg Glu Ile Glu Gly Ala Gly Leu Val Leu
85 90 95

Asp Gln Ser Ile Arg Glu Glu Asn Ser Asp Asp Tyr Pro Ala Gly Thr
100 105 110

Val Ile Gln Gln Asn Pro Arg Ala Gly Gly Glu Thr Ser Val Gly Ala
115 120 125

Ser Ile Thr Leu Thr Val Ser Thr Gly Pro Ser Leu Val Arg Val Pro
130 135 140

Val Ile Thr Gly Met Gln Trp Ser Gln Ala Glu Ser Asn Ile Thr Ser
145 150 155 160

Leu Gly Leu Val Pro Asp Ile Tyr Tyr Val Asp Ser Leu Leu Pro Glu
165 170 175

Gly Gln Val Ile Ser Ala Ser Gly Gln Gly Thr Glu Leu Pro Arg Gly
180 185 190

Ser Thr Val Thr Val Glu Ile Ser Asn Gly Met Leu Ile Glu Ala Pro

9/18

195

200

205

Asp Leu Ala Arg Leu Asp Val Asp Asn Ala Leu Lys Ala Leu Arg Asp
210 215 220

Ala Gly Trp Thr Ala Pro Asp Thr Ser Leu Ile Glu Gly Ala Pro Ile
225 230 235 240

Pro Thr Gly Ala Leu Val Asp Gln Gly Arg Ile Gly Phe Gln Asp Pro
245 250 255

Ser Pro Gly Gln Pro Leu Arg Lys Asp Ala Val Val Asn Ile Arg Leu
260 265 270

Tyr Arg

<210> 8

<211> 212

<212> PRT

<213> Thermobifida fusca

<400> 8

Gly Thr Asp Asn Ile Thr Ile Pro Asn Val Ala Gly Met Ser Val Glu
1 5 10 15

Glu Ala Thr Glu Thr Leu Gln Glu Lys Gly Phe Glu Asn Ile Glu Val
20 25 30

Ala Asp Glu Pro Thr Pro Ser Asn Glu Ile Glu Glu Gly Lys Val Val
35 40 45

Gly Thr Asp Pro Glu Ile Gly Glu Thr Val Pro Pro Asp Thr Glu Ile
50 55 60

Thr Ile Leu Ile Ser Gly Gly Pro Glu Met Ile Glu Met Pro Asp Leu
65 70 75 80

Val Gly Met Ser Gln Ala Asp Ala Leu Gly Glu Ile Asn Arg Ala Gly
85 90 95

Leu Ala Arg Gly Glu Ile Thr His Gln Glu Ser Asp Glu Pro Gln Gly
100 105 110

Thr Val Leu Ser Thr Asp Pro Lys Ala Gly Thr Glu Val Glu Pro Gly
115 120 125

Thr Lys Val Asn Leu Val Val Ala Lys Ala Ser Thr Lys Val Glu Val
130 135 140

Pro Ser Leu Ala Gly Met Asn Glu Asp Gln Ala Arg Glu Arg Leu Ala
145 150 155 160

Glu Leu Gly Leu Thr Leu Glu Ala Gln Thr Gln Glu Thr Ser Asp Ala
165 170 175

Thr Pro Gly Thr Ala Ile Ala Gln Ser Pro Gln Ala Gly Thr Lys Val
180 185 190

10/18

Glu Arg Gly Thr Thr Val Thr Val Thr Phe Ala Lys Glu Pro Gln Arg
195 200 205

Pro Glu Pro Pro
210

<210> 9
<211> 278
<212> PRT
<213> *Bifidobacterium longum*

<400> 9

Ser Glu Asp Thr Val Thr Ile Pro Glu Val Cys Asn Ala Ser Thr Ser
1 5 10 15

Lys Asp Ser Ile Glu Leu Lys Leu Lys Ala Ser Gly Leu Lys Met Thr
20 25 30

Glu Lys Gln Asp Thr Asp Ser Thr Glu Pro Glu Gly Thr Cys Thr Lys
35 40 45

Met Ser Pro Asp Ala Gly Ser Lys Val Ala Lys Gly Ser Ala Val Lys
50 55 60

Val Trp Phe Ser Ala Gly Pro Gln Ser Thr Gln Val Pro Asp Val Lys
65 70 75 80

Glu Arg Ser Gln Glu Glu Ala Arg Ser Ile Leu Glu Ser Ala Gly Phe
85 90 95

Lys Val Asn Ala Ala Val Lys Thr Glu Asp Ser Ala Asp Ile Ala Lys
100 105 110

Asp Met Val Thr Lys Thr Asp Pro Ala Ala Gly Gln Ser Val Pro Lys
115 120 125

Gly Thr Thr Ile Thr Ile Tyr Val Ser Ser Gly Met Thr Thr Val Pro
130 135 140

Ser Asn Leu Val Gly Gln Ser Lys Asp Ser Val Leu Gln Gln Tyr Glu
145 150 155 160

Gly Lys Phe Ser Phe Thr Val Glu Gln Glu Ser Ser Asp Thr Val Glu
165 170 175

Ala Gly Leu Ile Thr Arg Val Ser Pro Asp Ser Gly Ser Ser Ile Ala
180 185 190

Gln Gly Gly Phe Ile Thr Ile Trp Val Ser Thr Gly Lys Glu Lys Val
195 200 205

Ala Val Pro Asn Ile Thr Ala Gly Thr Asp Tyr Val Thr Ala Glu Leu
210 215 220

Met Leu Lys Ala Val Gly Leu Lys Ala Gln Ala Asn Gly Pro Thr Gly
225 230 235 240

Ser Thr Ala Val Val Val Ser Ile Asn Pro Gly Ala Gly Ser Gln Val
245 250 255

Asp Ala Gly Ser Thr Val Thr Ile Thr Thr Lys Ala Gly Ser Thr Gly
260 265 270

Gly Gly Thr Gly Thr Gly
275

<210> 10
<211> 268
<212> PRT
<213> Streptomyces coelicolor

<400> 10

Ser Gly Gln Phe Thr Lys Val Pro Pro Leu Leu Ser Lys Thr Glu Ala
1 5 10 15

Gln Ala Arg Asp Arg Leu Asp Asp Ala Gly Leu Asp Val Gly Lys Val
20 25 30

Arg His Ala Tyr Ser Asp Thr Val Glu Arg Gly Lys Val Ile Ser Thr
35 40 45

Asp Pro Gly Val Gly Asp Arg Ile Arg Lys Asn Asp Ser Val Ser Leu
50 55 60

Thr Val Ser Asp Gly Pro Asp Thr Val Lys Leu Pro Asp Val Thr Gly
65 70 75 80

Tyr Lys Leu Asp Lys Ala Arg Thr Leu Leu Glu Asp Glu Gly Leu Glu
85 90 95

Pro Gly Met Val Thr Arg Ala Phe Ser Asp Glu Val Ala Arg Gly Phe
100 105 110

Val Ile Ser Thr Lys Pro Gly Ser Gly Thr Thr Val Arg Ala Gly Ser
115 120 125

Ala Val Ala Leu Val Val Ser Lys Gly Ser Pro Val Asp Val Pro Asp
130 135 140

Val Thr Gly Asp Asp Leu Asp Glu Ala Arg Ala Glu Leu Glu Gly Ala
145 150 155 160

Gly Leu Lys Val Lys Thr Ala Asp Glu Arg Val Asn Ser Glu Tyr Asp
165 170 175

Ser Gly Arg Val Ala Arg Gln Thr Pro Glu Pro Gly Gly Arg Ala Ala
180 185 190

Glu Gly Asp Thr Val Thr Leu Thr Val Ser Lys Gly Pro Arg Met Ile
195 200 205

Glu Val Pro Asp Val Val Gly Asp Ser Val Asp Asp Ala Lys Gln Lys
210 215 220

Leu Glu Asp Ala Gly Phe Glu Val Asp Glu Asp Arg Gly Leu Leu Gly
225 230 235 240

Leu Phe Gly Asp Thr Val Lys Lys Gln Ser Val Asp Gly Gly Asp Thr

12/18

245

250

255

Ala Pro Glu Gly Ser Thr Val Thr Ile Thr Ile Arg
260 265

<210> 11
<211> 279
<212> PRT
<213> Streptomyces coelicolor

<400> 11

Gly Asn Asp Lys Val Pro Val Pro Ala Phe Ile Gly Leu Ser Lys Ala
1 5 10 15

Asp Ala Gln Gln Gln Ala Asp Asn Ile Asp Leu Val Leu Thr Phe Lys
20 25 30

Gln Gln Glu Cys Glu Asp Gln Pro Lys Gly Asn Ile Cys Ala Gln Asp
35 40 45

Pro Lys Gln Gly Thr Asp Val Asp Lys Glu Ser Thr Val Asn Leu Val
50 55 60

Val Ser Thr Gly Ala Pro Lys Val Ala Val Pro Asn Val Ile Asp Lys
65 70 75 80

Asn Ile Asp Glu Ala Lys Lys Gln Leu Glu Asp Lys Gly Phe Glu Val
85 90 95

Glu Thr Lys Gln Thr Glu Ser Ser Gln Asp Glu Gly Thr Ile Leu Ser
100 105 110

Gln Asn Pro Asp Pro Gly Lys Glu Leu Glu Lys Gly Ser Thr Val Thr
115 120 125

Leu Glu Val Ala Lys Ala Glu Glu Lys Ala Thr Val Pro Asp Val Val
130 135 140

Gly Arg Thr Cys Asp Glu Ala Lys Ala Gln Val Glu Ser Gly Gly Asp
145 150 155 160

Leu Thr Ala Val Cys Thr Asp Gln Pro Thr Asn Asp Pro Asn Gln Val
165 170 175

Gly Lys Val Ile Ser Thr Thr Pro Gln Ser Ser Thr Gln Val Asp Pro
180 185 190

Gly Ser Lys Val Thr Ile Val Val Gly Lys Ala Val Glu Lys Thr Lys
195 200 205

Val Pro Glu Val Arg Gly Lys Thr Leu Ala Glu Ala Arg Gln Ile Leu
210 215 220

Gln Gln Ser Gly Phe Thr Asn Val Gln Val Ala Gln Gly Ser Pro Gly
225 230 235 240

Asp Asp Asn Ala Lys Val Phe Ala Ser Asn Pro Gln Pro Gly Ser Glu
245 250 255

13/18

Val Asp Asp Pro Ala Ala Thr Pro Ile Thr Leu Met Thr Val Pro Gly
260 265 270
Asp Gly Gly Asn Gly Asn Gly
275

<210> 12
<211> 277
<212> PRT
<213> Bacillus subtilis

<400> 12

Met Pro Lys Asp Val Lys Ile Pro Asp Val Ser Gly Met Glu Tyr Glu
1 5 10 15

Lys Ala Ala Gly Leu Leu Glu Lys Glu Gly Leu Gln Val Asp Ser Glu
20 25 30

Val Leu Glu Ile Ser Asp Glu Lys Ile Glu Glu Gly Leu Met Val Lys
35 40 45

Thr Asp Pro Lys Ala Asp Thr Thr Val Lys Glu Gly Ala Thr Val Thr
50 55 60

Leu Tyr Lys Ser Thr Gly Lys Ala Lys Thr Glu Ile Gly Asp Val Thr
65 70 75 80

Gly Gln Thr Val Asp Gln Ala Lys Lys Ala Leu Lys Asp Gln Gly Phe
85 90 95

Asn His Val Thr Val Asn Glu Val Asn Asp Glu Lys Asn Ala Gly Thr
100 105 110

Val Ile Asp Gln Asn Pro Ser Ala Gly Thr Glu Leu Val Pro Ser Glu
115 120 125

Asp Gln Val Lys Leu Thr Val Ser Ile Gly Pro Glu Asp Ile Thr Leu
130 135 140

Arg Asp Leu Lys Thr Tyr Ser Lys Glu Ala Ala Ser Gly Tyr Leu Glu
145 150 155 160

Asp Asn Gly Leu Lys Leu Val Glu Lys Glu Ala Tyr Ser Asp Asp Val
165 170 175

Pro Glu Gly Gln Val Val Lys Gln Lys Pro Ala Ala Gly Thr Ala Val
180 185 190

Lys Pro Gly Asn Glu Val Glu Val Thr Phe Ser Leu Gly Pro Glu Lys
195 200 205

Lys Pro Ala Lys Thr Val Lys Glu Lys Val Lys Ile Pro Tyr Glu Pro
210 215 220

Glu Asn Glu Gly Asp Glu Leu Gln Val Gln Ile Ala Val Asp Asp Ala
225 230 235 240

Asp His Ser Ile Ser Asp Thr Tyr Glu Glu Phe Lys Ile Lys Glu Pro
245 250 255

Thr Glu Arg Thr Ile Glu Leu Lys Ile Glu Pro Gly Gln Lys Gly Tyr
260 265 270

Tyr Gln Val Met Val
275

<210> 13
<211> 16
<212> PRT
<213> Mycobacterium tuberculosis

<400> 13

Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro Arg
1 5 10 15

<210> 14
<211> 28
<212> PRT
<213> Mycobacterium tuberculosis

<400> 14

Ala Ile Ala Asp Ser Gly Asn Ser Val Pro Gln Thr Ala Ala Val Ile
1 5 10 15

Gly Thr Ala Gln Tyr Leu Ser Pro Glu Gln Ala Arg
20 25

<210> 15
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 15
gatagccata tgaccacccc ttcc

24

<210> 16
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 16
aaaccgaagc ttaacggccc accg

24

<210> 17
<211> 22
<212> DNA
<213> artificial sequence

<220>

<223> synthetic oligonucleotide

<400> 17

cggggcata tggcgccgt ga

22

<210> 18

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic oligonucleotide

<400> 18

gcagtcgtaa gcttatgccg ccg

23

<210> 19

<211> 469

<212> PRT

<213> *Mycobacterium tuberculosis*

<400> 19

Met Thr Thr Arg Leu Gln Ala Pro Val Ala Val Thr Pro Pro Leu Pro
1 5 10 15

Thr Arg Arg Asn Ala Glu Leu Leu Leu Leu Cys Phe Ala Ala Val Ile
20 25 30

Thr Phe Ala Ala Leu Leu Val Val Gln Ala Asn Gln Gln Asp Gln Gly Val
35 40 45

Pro Trp Asp Leu Thr Ser Tyr Gly Leu Ala Phe Leu Thr Leu Phe Gly
50 55 60

Ser Ala His Leu Ala Ile Arg Arg Phe Ala Pro Tyr Thr Asp Pro Leu
65 70 75 80

Leu Leu Pro Val Val Ala Leu Leu Asn Gly Leu Gly Leu Val Met Ile
85 90 95

His Arg Leu Asp Leu Val Asp Asn Glu Ile Gly Glu His Arg His Pro
100 105 110

Ser Ala Asn Gln Gln Met Leu Trp Thr Leu Val Gly Val Ala Ala Phe
115 120 125

Ala Leu Val Val Thr Phe Leu Lys Asp His Arg Gln Leu Ala Arg Tyr
130 135 . . 140

Gly Tyr Ile Cys Gly Leu Ala Gly Leu Val Phe Leu Ala Val Pro Ala
145 150 155 160

Leu Leu Pro Ala Ala Leu Ser Glu Gln Asn Gly Ala Lys Ile Trp Ile
165 170 175

Arg-Leu-Pro-Gly-Phe-Ser-Ile-Gln-Pro-Ala-Glu-Phe-Ser-Lys-Ile-Leu

16/18

180

185

190

Leu Leu Ile Phe Phe Ser Ala Val Leu Val Ala Lys Arg Gly Leu Phe
 195 200 205

Thr Ser Ala Gly Lys His Leu Leu Gly Met Thr Leu Pro Arg Pro Arg
 210 215 220

Asp Leu Ala Pro Leu Leu Ala Ala Trp Val Ile Ser Val Gly Val Met
 225 230 235 240

Val Phe Glu Lys Asp Leu Gly Ala Ser Leu Leu Leu Tyr Thr Ser Phe
 245 250 255

Leu Val Val Val Tyr Leu Ala Thr Gln Arg Phe Ser Trp Val Val Ile
 260 265 270

Gly Leu Thr Leu Phe Ala Ala Gly Thr Leu Val Ala Tyr Phe Ile Phe
 275 280 285

Glu His Val Arg Leu Arg Val Gln Thr Trp Leu Asp Pro Phe Ala Asp
 290 295 300

Pro Asp Gly Thr Gly Tyr Gln Ile Val Gln Ser Leu Phe Ser Phe Ala
 305 310 315 320

Thr Gly Gly Ile Phe Gly Thr Gly Leu Gly Asn Gly Gln Pro Asp Thr
 325 330 335

Val Pro Ala Ala Ser Thr Asp Phe Ile Ile Ala Ala Phe Gly Glu Glu
 340 345 350

Leu Gly Leu Val Gly Leu Thr Ala Ile Leu Met Leu Tyr Thr Ile Val
 355 360 365

Ile Ile Arg Gly Leu Arg Thr Ala Ile Ala Thr Arg Asp Ser Phe Gly
 370 375 380

Lys Leu Leu Ala Ala Gly Leu Ser Ser Thr Leu Ala Ile Gln Leu Phe
 385 390 395 400

Ile Val Val Gly Gly Val Thr Arg Leu Ile Pro Leu Thr Gly Leu Thr
 405 410 415

Thr Pro Trp Met Ser Tyr Gly Gly Ser Ser Leu Leu Ala Asn Tyr Ile
 420 425 430

Leu Leu Ala Ile Leu Ala Arg Ile Ser His Gly Ala Arg Arg Pro Leu
 435 440 445

Arg Thr Arg Pro Arg Asn Lys Ser Pro Ile Thr Ala Ala Gly Thr Glu
 450 455 460

Val Ile Glu Arg Val
 465

<210> 20

<211> 491

<212> PRT

<213> Mycobacterium tuberculosis

<400> 20

Met Asn Ala Ser Leu Arg Arg Ile Ser Val Thr Val Met Ala Leu Ile
1 5 10 15

Val Leu Leu Leu Leu Asn Ala Thr Met Thr Gln Val Phe Thr Ala Asp
20 25 30

Gly Leu Arg Ala Asp Pro Arg Asn Gln Arg Val Leu Leu Asp Glu Tyr
35 40 45

Ser Arg Gln Arg Gly Gln Ile Thr Ala Gly Gly Gln Leu Leu Ala Tyr
50 55 60

Ser Val Ala Thr Asp Gly Arg Phe Arg Phe Leu Arg Val Tyr Pro Asn
65 70 75 80

Pro Glu Val Tyr Ala Pro Val Thr Gly Phe Tyr Ser Leu Arg Tyr Ser
85 90 95

Ser Thr Ala Leu Glu Arg Ala Glu Asp Pro Ile Leu Asn Gly Ser Asp
100 105 110

Arg Arg Leu Phe Gly Arg Arg Leu Ala Asp Phe Phe Thr Gly Arg Asp
115 120 125

Pro Arg Gly Gly Asn Val Asp Thr Thr Ile Asn Pro Arg Ile Gln Gln
130 135 140

Ala Gly Trp Asp Ala Met Gln Gln Gly Cys Tyr Gly Pro Cys Lys Gly
145 150 155 160

Ala Val Val Ala Leu Glu Pro Ser Thr Gly Lys Ile Leu Ala Leu Val
165 170 175

Ser Ser Pro Ser Tyr Asp Pro Asn Leu Leu Ala Ser His Asn Pro Glu
180 185 190

Val Gln Ala Gln Ala Trp Gln Arg Leu Gly Asp Asn Pro Ala Ser Pro
195 200 205

Leu Thr Asn Arg Ala Ile Ser Glu Thr Tyr Pro Pro Gly Ser Thr Phe
210 215 220

Lys Val Ile Thr Thr Ala Ala Ala Leu Ala Ala Gly Ala Thr Glu Thr
225 230 235 240

Glu Gln Leu Thr Ala Ala Pro Thr Ile Pro Leu Pro Gly Ser Thr Ala
245 250 255

Gln Leu Glu Asn Tyr Gly Gly Ala Pro Cys Gly Asp Glu Pro Thr Val
260 265 270

Ser Leu Arg Glu Ala Phe Val Lys Ser Cys Asn Thr Ala Phe Val Gln
275 280 285

Leu Gly Ile Arg Thr Gly Ala Asp Ala Leu Arg Ser Met Ala Arg Ala
290 295 300

Phe Gly Leu Asp Ser Pro Pro Arg Pro Thr Pro Leu Gln Val Ala Glu

18/18

305	310	315	320
Ser Thr Val Gly Pro Ile Pro Asp Ser Ala Ala Leu Gly Met Thr Ser			
325	330	335	
Ile Gly Gln Lys Asp Val Ala Leu Thr Pro Leu Ala Asn Ala Glu Ile			
340	345	350	
Ala Ala Thr Ile Ala Asn Gly Gly Ile Thr Met Arg Pro Tyr Leu Val			
355	360	365	
Gly Ser Leu Lys Gly Pro Asp Leu Ala Asn Ile Ser Thr Thr Val Gly			
370	375	380	
Tyr Gln Gln Arg Arg Ala Val Ser Pro Gln Val Ala Ala Lys Leu Thr			
385	390	395	400
Glu Leu Met Val Gly Ala Glu Lys Val Ala Gln Gln Lys Gly Ala Ile			
405	410	415	
Pro Gly Val Gln Ile Ala Ser Lys Thr Gly Thr Ala Glu His Gly Thr			
420	425	430	
Asp Pro Arg His Thr Pro Pro His Ala Trp Tyr Ile Ala Phe Ala Pro			
435	440	445	
Ala Gln Ala Pro Lys Val Ala Val Ala Val Leu Val Glu Asn Gly Ala			
450	455	460	
Asp Arg Leu Ser Ala Thr Gly Gly Ala Leu Ala Ala Pro Ile Gly Arg			
465	470	475	480
Ala Val Ile Glu Ala Ala Leu Gln Gly Glu Pro			
485	490		